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## MEDICINE AS A CAREER.

To the young man about to choose a professional career, medicine at this time offers opportunities for the employment of the highest mental faculties, for the increase of knowledge, for usefulness to the world, and for the attainment of true happiness, such as no other profession presents. It is not meant by this to assert that it will certainly secure to its followers all or indeed any of these things, but that, given the same degree of intellect with a good preliminary education, the probabilities are that out of a thousand men taking up the study of medicine more will attain success than will do so among a similar number of young men of like character and attainments who devote themselves to theology, law, politics, or education.

What is the meaning of "success" in this connection? I call a successful career one in which the man has done good work, the best of which he was capable, work in which he was strongly interested and which in itself gave him pleasure, work done unselfishly because he believed it to be good work which ought to be done and not merely performed as a means grudgingly made use of to obtain wealth or fame or power as the real objects sought. It is a career which has secured a happy home and sufficient means to support it, although it may not have led to wealth; it has brought to its pursuer the approval and friendship of those best acquainted with his life and work, although it may not have made him famous or given him decorations or formal honors; it has made his advice valued and sought for by those who know him, although it may not have given him an executive office or made him a ruler over his fellow-men. Such a career does not protect from the afflictions and sorrows common to humanity, but it does away in a great measure with boredom and *ennui*, with weary waiting for something to turn up, and the work itself is the best resource against inevitable grief. The man who achieves such a career has not been dependent on his acquaintances for his happiness, he has not fretted and worried because his family or his friends or his associates or the state have not recognized his merit according to his conception of it, for he has acted on the principle that he exists for their benefit and that they are not merely his appendages.

In speaking of a medical career as a means of obtaining such success, the word medicine is used in its broadest sense to include the study of the phenomena of human life—disease and death—the circumstances by which these can be influenced, and the practical application of the results to prevention as well as to cure. No other profession affords such opportunities for investigation and experiment or a greater field of usefulness, and no other profession demands so much knowledge of natural science and of the laws of being. Of all men, the skilled physician stands nearest to the veil of Isis, which is becoming thinner, though it may never be lifted. To one who has a thirst for knowledge for its own sake or as a means for the benefit of others, the problems of the medicine of to-day offer peculiar attractions, for it is not that which is known, but that which is half known, mysterious, tantalizing, and which apparently might be known by special study, which attracts such a man.

In the preface to the "*Meddygon Myddfai*," a Welsh medical work dating from the thirteenth century, the scribe declares that the reason why the authors Rhiwallon and his sons "thus caused a record of their skill to be committed to writing was lest no one should be found after them so endowed with the requisite knowledge as they were." We may excuse the *naïve* vanity of these physicians in view of their desire to make their knowledge available for the general good; but there is small danger that any skilled practitioner of to-day will be troubled with the fear which beset the physicians of "*Myddfai*." The more he knows of the huge strides which have been made in recent years in our knowledge of the laws of life and of disease, the more he sees the extent of the dim, hazy, shifting outlines which yet remain to be explored, measured, and mapped out. He must be a student so long as he lives; as yet there is no visible end of the things which he does not know and ought to know and has reason to think that he might know by the expenditure of a little time and effort. Let us consider a few of the simplest examples.

We know that the cholera *bacillus* is the essential or immediate cause of Asiatic cholera; but we do not know why it was that when, the other day, von Pettenkoffer and Emmerich swallowed several millions of cholera *bacilli* and proved that these were living in their alimentary canals they did not have cholera. Was it due to the fact that the *bacilli* had their nature changed by culture, or was it due to the mysterious "*x*" which von Pettenkoffer supposed was present in Hamburg and not in Munich? We know that malaria is probably

due to a minute animal organism which has several stages of development, some of which occur while it is in the human body. But we have not yet been able to observe the growth and development of this organism outside the human body, where it probably has a different form. It may be, for instance, in a mosquito, and until we know, we have not mastered the chief problem in the important matter of practical prevention of malaria. We know that typhoid fever is caused by the poisonous products produced by a minute vegetable, the *bacillus* of typhoid; but we do not know whether this *bacillus* has one or many forms, or whether it may not under certain circumstances be developed from organisms which every man carries within his alimentary canal during adult life. Probably also the effects of this *bacillus* or of its products are modified to a considerable extent by the antecedent or coincident action of certain other *bacteria* and their products; but experiments on this point have only just been commenced. We know that the products formed by the growth of certain disease-producing *bacteria*, as, for instance, those of *anthrax* or tetanus, have the power of making an animal immune against those diseases, or, in other words, that the poison is hostile to the organisms which produce it; and this is probably about to become the basis of new and successful modes of treatment as well as of prevention of such diseases, but the amount of work yet to be done to place this on a firm scientific basis is enormous.

It is now known that the brain is not a single organ, but an aggregation of many nerve-centres, each having a more or less distinct function, although closely connected with others; that the action of some of these centres may be specially stimulated or checked either by certain products evolved by various organs and parts of the body or by certain drugs or by producing certain sensations through the channels of vision and of hearing. Thus, through the modern methods of investigation of the structure, connections, and functions of these nerve-centres, we are beginning to understand better the mental phenomena of man and their aberrations as the result of disease or of drugs or hypnotism. We have now some means of measuring the rapidity of mental action and find that "as quick as thought" is really not very quick, and we can locate certain lesions of the brain, from the external symptoms which they produce, with so much precision as to justify the surgeon in opening the skull at the point indicated and removing the cause of the trouble. Yet psychophysics and the physiology, pathology, and therapeutics of the

nervous system are branches of medicine which as yet are only in their infancy and in which there are many modes of investigation yet to be tried.

In like manner, I might indicate the possibilities, even the probabilities, that such diseases as diphtheria, hydrophobia, tetanus, rheumatism, yellow fever, and cancer will in the near future be deprived of much of their danger by the results of scientific study. I might take up each of the systems, organs, and fluids of the living body and show how the latest methods and discoveries in bacteriology, chemistry, electricity, etc., remain to be applied in research, in diagnosis, or in therapeutics with regard to them; but enough has probably been said to prove not only the variety and extent of the fields to be explored, but that they lie close at hand and are really explorable. And every new discovery widens the horizon and opens new paths. It would be easy to-day to set before each of a hundred skilled investigators a problem in physiology or pathology as yet unsolved, but probably solvable by a few years' patient labor; and each one of these students in the course of his work would undoubtedly come across a dozen other problems as side issues which would claim attention. The clergyman subscribes to certain doctrines which he is to expound and explain; the lawyer takes a proposition and collects evidence in favor of it; but the physician collects evidence first and then asks, not what it proves, but what it makes probable.

That which is unknown, but probably knowable, has, as I have said, great attractions for certain minds, and to such medicine as a career needs no other panegyric than the indication of the possibilities which it presents. The tastes of other men incline not so much to actual experiment as to the collation and comparison of the results of the experiments of others. In this, also, medicine presents at the present time peculiar attractions. Its current literature is of vast extent, and while much of this literature is worthless, much of it is suggestive, and perhaps one per cent of it is of permanent value. Now, it is this very fact that it requires search and discrimination to find what is useful that is attractive to certain minds. Just as, in the early days of California, pocket-hunting had a zest of its own which regular quartz-mill work could not give, so the man who commences a literary research for what has been reported with regard to some peculiar disease or method of treatment may take great pleasure in the search itself and be rather disappointed than otherwise if he

comes across an article in which he finds the work ably done for him. The great difficulty in this field of investigation is, for most men, the want of access to the books required.

Passing now from the pleasures of study for its own sake, which in the eyes of a few surpass all others, let us briefly consider the inducements which medicine offers as a career to the man who desires knowledge mainly as a means to an end, that end being practical utility to his fellow-men.

A professional man is defined as one who professes or announces that he is in possession of special knowledge such as the great majority of men do not have, and that he is willing to furnish the benefit of his knowledge to his fellow-men in the shape of advice or supervision of certain of their affairs. The three learned professions offer such advice and supervision with reference to men's souls, property, and bodies; but, as Mr. Evarts has remarked, the field of usefulness is more universal for medicine than it is for law or theology, since there are many who have no property to be cared for and there are some with regard to whose possession of souls there may be a question; but everybody has a body, which at times is liable to require skilled management to avoid suffering and death and to enable it to do its work, although some bodies, it must be confessed, are hardly worth preserving. Almost every one sooner or later desires the aid of the physician's special skill for himself or for his family; wealth, genius, fame, power do not specially diminish this need, nor do poverty and ignorance exempt from it. It is true that there are things more important than bodily health, that there are times and occasions when it is one's duty to undertake or persist in a mode of life which will almost certainly produce premature disability or death, and, as Dr. Allbutt says, "there is something not heroic in the mere health-hunter, the man who wanders from doctor to doctor and from land to land, not that he may do his duty the better, but that he may have an ache the less." This, however, does not make it the less necessary for physicians to supply the wants of all, trivial though they may seem to him, for each must be allowed to judge for himself as to where and how much the shoe pinches.

Consider the practical usefulness of medicine. It is not merely physical pain in individuals that is to be lessened or averted. Its results extend far beyond the man whose disability is removed, whose pain is diminished, whose death is delayed, and who is thus enabled to go on with his share of the world's work; they affect the welfare and

happiness of his family, of his associates, and, it may be, the interests of a nation, or of the world of science, of literature, or of art. It deals also with the health of cities and of nations, with great commercial interests, threatened on the one hand by epidemics and on the other by unwise and unnecessary restrictions imposed under the dictates of panic, the offspring of ignorance and cowardice, and its power and possibilities are inextricably involved in many social problems of the gravest importance to modern civilization.

The relative influences of heredity and of environment in the production of the defective, dependent, and dangerous classes of society, of the feeble-minded, the insane, the deaf-mutes, the vagrants, and the criminals, the means of preventing such production or of dealing with them after they have been produced, are all medical quite as much as they are sociological questions. It is to specially skilled physicians that the jurist looks for advice in dealing with persons whose responsibility for their actions is doubtful; the wise theologian will seek their counsel in cases of morbid conscientiousness and self-reproach, of epidemic emotional manifestations under religious influence, of alleged miracles. The professional educator, from the teacher in a common school to the head of a great university, has need of the information which the medical sciences are collecting with regard to the development of the organs of sensation, of memory, of comparison, and of judgment, which he is training for the coming generation, the men and women of the twentieth century; and with regard to the effects of variations in light, food, exercise, succession or order of studies, and many other things connected with school or college life upon the little masses of gray nerve substance which form the physical substratum of intellect, of emotions, and of morals. Whether one supposes that soul, intellect, and vital force are each distinct entities, having an existence independent of these nerve-centres, or that one or more of them are the result of the organization and function of such centres, all must admit the fact that injury to these centres modifies or prevents their manifestations. With a little change in certain cells of the cortical gray, a change which requires the use of the microscope to determine, the orator becomes speechless, the judge becomes a criminal, and the prudent man of business, the affectionate husband and father, the model citizen and pillar of the church becomes extravagant, unchaste, deceitful, and thus enters upon the first stage of a degeneration which, if unchecked, will make him a hopeless paralytic and a drivelling idiot.

In the first part of this paper has been briefly indicated the vast field of unknown and imperfectly-explored regions which belong to medicine, and from this point of view it may be supposed by some that our present knowledge is of little value. This is by no means the case. Modern medicine possesses great knowledge and power, much more in some cases than it is allowed to use, because popular opinion has not yet been educated to the point of appreciating its value. It is in the curious position of continually offering advice which, if accepted, would greatly lessen the need of the public for its services. When people are ready to obey the physician it is in many cases too late for them to have the benefit of his most valuable knowledge and skill: the tissues are already degenerated, the arteries are prematurely old, the epidemic is already raging among the people. The medicine of the future is preventive medicine, that which will foresee the evil while it is as yet afar off and take measures to avert it.

I have said that a successful career brings to its pursuer the approval and friendship of those who best know his work, and this is preëminently true of practical medicine. In some matters the wife trusts the medical man more than she does her husband, the youth comes to him in trouble concealed from his parents, and the man of business confides in him as he does not in his partner. The skilled physician becomes not only the trusted adviser in disease, but the personal friend, the one who is appealed to for sympathy in joy as well as in trouble, whose company is sought upon all occasions, whose mere personal presence brings with it assurance and comfort. Almost every reader of this paper knows some such man, in whose honesty of purpose, fidelity in keeping confidences, and readiness to undergo toil and trouble for the sake of his patients, all who know him have perfect confidence; he lives, as Mr. Bayard has said, "surrounded by an atmosphere of love and trust, holding as it were the heart-strings of a family in his hands." Sweet as are such trust and affection on the part of his patients, at least equally sweet are the confidence and friendship which come to him from those best qualified to judge of that part of his work which has been done rather for the benefit of the community, of science, and of the world than for individuals. These are, for the most part, the members of his own profession whom he has helped. Some of them may have been his immediate pupils; others, whom he may never see, have read his writings or have in other ways obtained help from his labors and express their appreciation of it in many ways. Through the respect and confidence thus

developed he becomes a well-known consultant, the man whose advice is sought by his brother-physicians in doubtful and difficult cases. This increases his experience and his influence and calls his attention to the many points in which medical science is still defective; for too often when he sees the case he can but recognize its incurability and offer only transient relief from suffering.

The phrase "brother-physicians" is one that applies especially in medicine, because for more than two thousand years in all civilized countries educated physicians have recognized each other as belonging to a brotherhood. It comes from the time when the study of medicine was hereditary in certain families and when the candidate swore by Apollo and all the gods "to reckon him who taught me this art equally dear to me as my parents, to share my substance with him and relieve his necessities if required, to look upon his offspring as my own brothers," etc. Thus medical men everywhere recognize the claim of a physician to advice and care in case of sickness or injury and accept no fee for it. As Weir Mitchell says, "the physicians' guild is a world-wide guild, the only one."

It is necessary, in speaking of medicine as a career, to consider its demands as well as its inducements, and these demands, for those who wish to secure such success as I have referred to, are for good mental capacity, for a long period of study, for much patience, for powers of physical endurance, for quick and keen sympathies, for honesty and for purity of thought, word, and deed. In the hands of the physician are placed at times not only the issues of life and death, but of things more valuable than these. Not more than one man in a thousand can properly comply with all these demands. The young man whom I would advise to take medicine as a career should have had a broad preliminary education, he should know his "humanities," and it is highly desirable that he should have taken his B.A. degree at a large university, not merely as a guarantee that he has had proper training, but because of the associations which he will have formed there, the ideas which are in the air, the intelligent sympathy with literature, science, and art which will there be developed and which is essential to his future usefulness and happiness. He is then to take a four years' course of instruction in a medical school having ample facilities in the way of laboratories and hospitals. Following this should come a service of a year and a half as resident in a large hospital.

By the end of this period, and not much before the end of it, he will be qualified to form a fairly wise judgment as to his own

capacity and tastes and as to the particular branch or branches of medicine which are best suited to his wishes. He must beware of beginning to specialize too soon; the foundations must be broad. Now he can decide whether his next two or three years of study shall be spent chiefly in laboratories or in clinics, or how they shall be divided between the two. As an undergraduate in medicine, his work in laboratories must be confined to the learning of a few methods of *technique* and something of the spirit which animates research. When he comes to making original research for himself, he will find that its demands for unremittent persistent attention and thought are such that for the time being he can do little else. The clinic instruction which he needs after his residence in the hospital is not to be had in one place or from one man: he needs to compare the manners, the methods, and the results of different men, each the leader in his own place, and for this purpose he must travel and visit the great clinics in different cities. This done he will be ready to go to work, he will have some idea, though probably not an adequate one, of the things he does not know, and his advice and opinions will begin to be valuable. There is little cause to fear lest he do not find employment; there is always a place for a competent and trustworthy man-for one who can be depended on to work without supervision and to do more than the letter of his engagement calls for; and in laboratories, in hospitals, in medical schools, and in the broad field of practice there are such places waiting to-day for the men who have not yet been found for them.

But it will be said by some, "You demand too much time and money for education and training; the man ought to begin to support himself long before your scheme would permit him to do so." My answer is that the man who has the means which will enable him to spend the time above indicated as required to fit him to take charge of the health and lives of his fellow-men had better so invest them, while he who has not such means should carefully consider as to whether he had better not abandon all thought of studying medicine and try some of the numerous other occupations which offer a better investment for his time and money and in which he may be a less dangerous and more useful member of society. This country is in no need of men possessing the diploma of Doctor of Medicine; it already has at least twenty thousand more of them than it requires or can properly support; but it does need several hundred, say a thousand, more of such properly-trained physicians as I have indicated, and I

am quite sure that the people will be able to recognize them when they appear and will take proper care of their material interests.

My young friend whose attention I wish to direct to medicine as a career will have spent five years at a good intermediate school as a preliminary to entering the university, which he does when he is about seventeen years old. He spends three or four years at the university, four years at the medical school, one and one-half years in the hospital, and two years in travel and special studies. When, therefore, he is ready to begin work he will be about twenty-eight years old, and his education, living, books, etc., will have cost about eight thousand dollars from the time he entered the university. It can be done for less, but this is a fair average estimate.

I am not considering medicine as a trade or looking at it from the commercial point of view. I have not presented among its attractions the probabilities of being able to have a villa at Newport or to keep a yacht or fast horses, but have only claimed that it will provide means to secure a comfortable and happy home and to aid in some degree those who are less fortunate. The physician whom I have in mind cannot afford to waste his time in making more money than is required for his own immediate needs and for those of his family; as one who has had special advantages in culture and in the acquisition of knowledge, he is subject to special claims on the part of his fellow-men who have not been granted such opportunity. The torch of science is placed in his hands, not merely to illuminate his own path, but to enable him to guide and help others in their passage over Mirza's bridge, out of the darkness into the darkness; and, moreover, it is his duty to hand it on to his successors with added fuel, that it may be more bright for them than it has been for himself. His duties as a citizen are higher than those of non-professional men, for increase of knowledge brings with it not only power, but responsibility as well. This, no doubt, brings upon him at times special cares and anxieties: he will see signs of coming trouble in what to most men may appear to add to beauty or to be evidences of robust health and prosperity; he may have to take the unpleasant part of Cassandra in giving unheeded warnings of evils to come. But these are but incidental and occasional troubles, far more than counterbalanced by the satisfaction derived from the interesting, continuous, useful employment and development of every human faculty which even now belongs to, and which in the near future will still more characterize, medicine as a career.

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